

B. Remarks

The claims are 1-3, with claim 1 being the sole independent claim.

Reconsideration of the claims is expressly requested.

Claims 1-3 stand rejected under 35 U.S.C. § 103(a) as being allegedly obvious from U.S. Patent No. 4,825,249 (Oki) in view of U.S. Patent Nos. 3,024,209 (Ferrigno) and 3,387,071 (Cahill). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like to briefly discuss some of the features and advantages of the presently claimed invention. That invention, in pertinent part, is related to a process for producing a cleaning blade. In this process, a urethane blade is first dried to limit the water content of the urethane resin to 1% by weight or less. Then, at least a portion of the blade is impregnated with an isocyanate compound. After the impregnation, warm or hot air at a temperature not lower than the melting point of the isocyanate compound is blown on the blade surface to remove the isocyanate compound remaining on the surface. The urethane resin that forms the blade is allowed to react with the isocyanate compound to form a cured layer. As result of this process, the prior art problems associated with the friction of a urethane resin blade are resolved.

Since the urethane resin has hydrophilic groups, it tends to absorb moisture from the air and has a water content of more than 1% by weight. However, if the urethane resin contains this much water, the isocyanate compound reacts with the water to generate foam, which makes the blade surface uneven (page 21, line 24 -page 22, line 2). In addition, water inhibits the reaction of the isocyanate compound and the urethane resin.

Therefore, in the present invention, the urethane resin is dried before the isocyanate impregnation takes place in order to reduce the water content.

Oki discloses a cleaning blade for use with a photoelectronic copying machine, comprising a urethane substrate coated with a specific perfluoropolyether, which may have an isocyanate at one of its ends. As noted by the Examiner, Oki teaches applying the perfluoropolyether by dipping. However, as acknowledged by the Examiner, Oki does not disclose or suggest drying the urethane substrate before the perfluoropolyether is applied to reduce the water content to 1% by weight or less.

Nevertheless, the Examiner has alleged that Ferrigno, by reciting that the pigments should have less than 1% free moisture when added to a polyurethane prepolymer, discloses the criticality of the water content of less than 1% by weight as claimed and makes this water content obvious to implement in Oki. Applicants respectfully disagree.

Ferrigno is directed to polyurethane foam that uses an inorganic pigment coated with a polymeric material as a filler material. Ferrigno teaches that a certain amount of water is purposely added to the polyurethane with a pigment to foam the polyurethane (column 8, lines 17-27). A technique of intentionally adding water to a system is different from the one of intentionally removing water from a system. Foaming, however, is not conducted in Oki or in the present invention.

Ferrigno, at column 9, lines 43-44, teaches that “[t]he filler was mixed in the polymer solution, the mixture dried to a free moisture content of less than 1.0 percent.” Applicants submit, however, that this free moisture content of less than 1.0 percent is for

adjusting the amount of water used as a foaming agent in the process of forming a completed product. There is no suggestions that this is relevant in the context of the cleaning blade forming process disclosed in Oki or that 1% by weight or less of water based on the weight of the urethane resin as presently claimed is critical for blade formation. Thus, Ferrigno does not suggest the water content as it relates to an alleged combination with Oki or its criticality.

The criticality of the presently claimed moisture content of the urethane resin blade is clearly demonstrated by Comparative Example 1 in the present application. Specifically, in Comparative Example 1, a urethane blade was not dried prior to being immersed into the isocyanate bath. As a result, the urethane resin had a water content from 1.5 to 2.1 % by weight. However, in Example 1, when the same blade was dried prior to being immersed in the bath, the water content was only 0.6-0.8 % by weight. The blade in Comparative Example 1 was found to have inferior properties to that in Example 1 (Table 1). This data clearly rebuts any presumption that it would have been obvious to carry out the drying step in Oki to limit the moisture content as claimed.

Consequently, since Ferrigno does not teach or suggest the water content recited in the present claim 1 or its criticality, the present invention is unobvious over each of the cited references and the Examiner's suggested combination thereof.

Cahill cannot cure the deficiencies of Oki and Ferrigno. Cahill is directed to modified urethane fibers. Specifically, Cahill teaches how to modify urethane fibers to improve their heat resistance, toxic properties and elasticity (col. 1, lines 43-56). Cahill,

however, also does not disclose or suggest at least steps (1) and (2) of the presently claimed invention.

In conclusion, Applicants respectfully submit that whether considered separately or in any combination, the documents of record fail to disclose or suggest the presently claimed elements. Wherefore, withdrawal of the outstanding rejections and passage of the application to issue are respectfully requested.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

/Jason M. Okun/
Jason M. Okun
Attorney for Applicants
Registration No. 48,512

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

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